

Amendments to the Claims

In The Claims:

Please amend the claims as follows:

1.(Twice Amended) A method for plating a second metal directly to a first metal, said method comprising [the steps of]:

providing a semiconductor substrate including at least one metal feature and at least one insulating layer covering said metal feature and said substrate;

forming at least one recess in said at least one insulating layer thereby exposing at least a portion of said metal feature;

forming at least one conductive barrier layer over said insulating layer and said exposed portion of said metal feature;

forming a plating seed layer of a first metal over said at least one barrier layer;

depositing a photoresist layer over ~~aid~~ said plating seed layer and in said at least one recess;

removing portions of said photoresist layer and portions of said plating seed layer outside of said at least one recess;

removing photoresist remaining in said at least one recess; and

electroplating a second metal to said plating seed layer in said recess without utilizing a lithographic mask.

3. (Amended) The method according to claim 1, wherein said conductive barrier is provided by sputter deposition of a layer of at least one nitride of tantalum on said insulating layer and said exposed portion of said metal feature and subsequent sputter deposition of a layer of tantalum on said tantalum nitride layer, such that the [layer including the nitride of tantalum] layer of tantalum on said tantalum nitride layer is in the α -phase.

7. (Amended) The method according to claim 6, wherein said copper is sputter coated on said conductive barrier layer [of tantalum].

12. (Amended) The method according to claim 1, wherein said portions of said photoresist layer and said plating seed layer outside of said at least one recess are removed by chemical-mechanical polishing.

16. (Amended) The method according to Claim 1, further comprising [the step of]:

removing said at least one conductive barrier layer from horizontal portions between [aid] said at least one recess [recesses].

22.(Twice Amended) A method for plating a second metal directly to a first metal, said method comprising [the steps of]:

providing a semiconductor substrate including at least one metal feature and at least one insulating layer covering said metal feature and said substrate;

forming at least one recess in said at least one insulating layer thereby exposing at least a portion of said metal feature;

forming at least one conductive barrier layer over said insulating layer and said exposed portion of said metal feature;

forming a plating seed layer of a first metal over said at least one barrier layer;

providing a pad in said at least one recess for preventing removal of portions of said seed layer in said at least one recess;

removing portions of said plating seed layer outside of said at least one recess;

removing said pad; and

electroplating a second metal to said plating seed layer in said recess without utilizing a lithographic mask.

24. (Amended) A method for plating a second metal directly to a first metal, said method comprising:

providing a semiconductor substrate including at least one metal feature and at least one insulating layer covering said metal feature and said substrate;
forming at least one recess in said at least one insulating layer thereby exposing at least a portion of said metal feature;
forming at least one conductive barrier layer over said insulating layer and said exposed portion of said metal feature;
forming a plating seed layer of a first metal over said at least one barrier layer;
removing portions of said plating seed layer outside of said at least one recess;
and
electroplating a second metal to said plating seed layer in said recess without utilizing a lithographic mask.

30. (Amended) The method according to Claim 29, wherein said copper is sputter coated on said conductive barrier layer [of tantalum].

38. (Amended) The method according to Claim 24, further comprising:
removing said at least one conductive barrier layer from horizontal portions between said at least one recess [recesses].

49. (Amended) The method according to Claim 48, wherein said copper is sputter coated on said conductive barrier layer [of tantalum].

57. (Amended) The method according to Claim 22, further comprising the step of:
removing said at least one conductive barrier layer from horizontal portions between said at least one recess [recesses].